Solutions: Designing Studies Checkpoint 1

Question 1

Select one answer.
10 points

The most important reason for the use of random allocation of subjects to the different treatments is:

(a) to ensure that each subject in the trial receives the best possible treatment.

(b) to guarantee that approximately the same number of subjects is assigned to each treatment group.

(c) to protect the experimenters from legal action in the event that the experiment goes drastically awry.

(d) to ensure that the different treatment groups are as similar as possible in every way **except** for the treatment received.

(e) to guarantee that the results of the experiment can never be duplicated.

Correct answer: (d)

Question 2

Select one answer.
10 points

It is known that in the United States, well-educated people are less likely to smoke. But what about other nations, where there may be different cultures and/or attitudes towards smoking? In a 1998 study of the relationship between education and smoking in France, a random sample of 334 French men was classified according to their education level (elementary, high-school, or university) and their smoking habits (smoker or non-smoker).

Which of the following is correct?

(a) This study is an experiment, since each subject was classified into one of the six possible combinations of education level and smoking habits.

(b) This study is an experiment, since it was based on a random sample.

(c) This study is an observational study, since researchers did not assign the men to be smokers or non-smokers, or to one of the education levels.

(d) This study is a combination of both an experiment and an observational study.

Correct answer: (c)

Question 3

Select one answer.
10 points

In an experiment to see if aspirin reduces the chance of having a heart attack, a placebo is:

(a) the place where the subjects go when they have a heart attack.

(b) a dummy pill that looks like aspirin but has no active ingredients.

(c) a procedure for deciding who gets the aspirin treatment.

(d) the sampling method.

(e) the randomization procedure.

Correct answer: (b)

Question 4

Select one answer.
10 points

The main advantage of experiments over observational studies is that:

(a) a well-designed experiment can give good evidence that the treatment actually causes the response.

(b) an experiment can compare two or more groups.

(c) an experiment is always cheaper.

(d) an experiment is always shorter.

(e) we can include more than one explanatory variable in the study.

Correct answer: (a)

Question 5

Select one answer.
10 points

Students in a large statistics class were randomly divided into two groups. The first group took the midterm exam with soft music playing in the background while the second group took the exam with no music playing. The exam scores of the two groups were then compared.

This experiment was not blind because:

(a) students were allowed to keep their eyes open while taking the exam.

(b) the exam was too long.

(c) the students knew whether or not music was playing while they were taking the exam.

(d) some of the students did not study for the exam.

(e) students were randomized into the two groups.

Correct answer: (c)

Question 6

Select one answer.
10 points

To test an herbal treatment for depression, 100 volunteers who suffered from mild depression were randomly divided into two groups. Each person was given a month's supply of tea bags. For one group, the tea contained the herb mixed with spice tea, whereas for the other group, the bags contained only the spice tea. Participants were not told which type of tea they had, and were asked to drink one cup of tea per day for a month. At the end of the month, a psychologist evaluated them to determine if their mood had improved. The psychologist did not know which of the subjects had the tea with the herbal ingredient added.

Which is true regarding this study?

(a) This study is an observational study.

(b) This study is double-blind.

(c) The "only spice tea" group serves as the control group.

(d) All of the above are true.

(e) Both (b) and (c) are true.

Correct answer: (e)

Question 7

Select one answer.
10 points

For their 1992 study “The Effect of Country Music on Suicide” (published in *Social Forces*, vol. 71, p. 211), researchers Stack and Gundlach investigated various American communities, recording the number of minutes of daily radio airtime devoted to country songs and the suicide rate. They found a moderately strong positive correlation.

In their paper, the researchers explain the results by saying that “…the themes found in country music **foster** a suicidal mood ...” (emphasis added). A news headline (The Independent [London], October 1, 2004, p. 15) about the research echoed these sentiments when it said, “Strange But True: Country Music Saps Will to Live.” The research is even cited on various suicide-prevention websites, some with headings such as “Country Music Increases Suicide Risk.”

Based on this study, can we have confidence in causality between country music and suicide?

(a) Yes, as long as the communities were sampled randomly, and the number of communities (the sample size) was sufficiently large.

(b) Yes, causality is indicated by the moderately strong correlation.

(c) Yes, since different communities listened to different levels of country music, meaningful experimental comparisons can be made.

(d) No, because the lack of assignment of communities to different levels of country music listening means there is a possibility of lurking variables.

(e) No, causality can only be demonstrated by investigating the entire population.

Correct answer: (d)